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FAQ: K2, Spice Gold, and Herbal 'Incense'

Legal Herbal Products Laced With Designer Drugs: Not Your Father's Marijuana

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March 5, 2010 - K2, Spice Gold, and dozens of other currently legal "herbal incense" products are spiked with powerful designer drugs -- and they don't show up in drug tests.

As early as 2004, this type of product began appearing for sale on the Internet and in head shops in Europe. By 2008, sales throughout Europe soared; U.S. and Canada sales took off in 2009.

"I believe it is everywhere in the United States," Marilyn Huestis, PhD, chief of chemistry and drug metabolism at the National Institute for Drug Abuse, tells WebMD.

Package labels feature psychedelic art and claim that the contents are a mixture of various herbs. But unlike smoking the herbs listed on the label, smoking the products produces effects similar to those of marijuana, hashish, and other forms of cannabis.

"Hospitals in Europe began to report instances where a person appeared with all the symptoms of cannabis intoxication, but their drug screen was negative," Huestis says.

Users, parents, public health officers, and enforcement agencies all want to know: What really is in these products? How safe are they? Are they addictive?

Here are WebMD's answers to these and other FAQs.

What drugs are in K2, Spice Gold, and other herbal incense products?

Initial tests of Spice Gold and similar products found no illegal substances and were not able to detect active ingredients that could explain the "high" they

produced in users. The tests also were unable to detect most of the herbs the products were supposed to contain.

Finally, in late 2008, Volker Auwarter, ScD, and colleagues in the forensic toxicology lab at the University Hospital Freiburg, Germany, found that the products contained at least two different designer drugs known as synthetic cannabinoids.

The drugs detected by Auwarter had the same chemical signal as drugs detected -- but not identified -- in samples of Spice brand product tested privately by the user-oriented Erowid drug information web site in 2007.

Like THC, the active ingredient in marijuana and other forms of cannabis, these synthetic cannabinoids turn on the cannabinoid receptors found on many cells in the body. The brain is particularly rich in the CB1 cannabinoid receptor.

But most synthetic cannabinoids are quite different chemical structures from THC. And unlike cannabis, the new drugs have never been tested in humans.

One of these synthetic cannabinoids, JWH 018, was first made in 1995 for experimental purposes in the lab of Clemson University researcher John W. Huffman, PhD.

"In terms of biological activity, these things are similar to THC, the active compound in cannabis," Huffman tells WebMD. "Now the thing is, nobody knows anything about how these new compounds act in the human body. Anecdotal reports say they stick around in the body for quite a long time."

More than 100 different synthetic cannabinoids have been created. In his 2008 study, Auwarter tested seven of the herbal products and found they contained different levels of JWH 018, a synthetic cannabinoid created by Pfizer called CP 47,497, or both.

Since then, Auwarter has found five different synthetic cannabinoids in the products. Huestis estimates that about 10 different synthetic cannabinoids have been detected in the products, usually in some combination.

Are K2, Spice Gold, and other herbal incense products safe?

No. Until a drug is tested, it cannot be considered safe. Not only have synthetic cannabinoids not been tested, nearly all were created for experimental use in animals and cell cultures -- not in humans.

And there are good reasons to believe that some if not all of these drugs are unsafe. JWH 018 and its many cousins, for example, have a chemical structure shared with known cancer-causing agents.

JWH 018 inventor John W. Huffman, PhD, puts it bluntly.

"It is like Russian roulette to use these drugs. We don't know a darn thing about them for real," he tells WebMD.

Most of these drugs were created because they bind much more tightly to the body's cannabinoid receptors than THC does. THC, in fact, only partially binds to these important regulators of body function. Many of the synthetic cannabinoids fully activate the receptors.

"When you take these drugs, you are hijacking the part of the brain important for many functions: temperature control, food intake, perception, memory, and problem solving," Huestis says. "And people taking these high-potency drugs are affecting other important functions throughout their bodies -- hormone functions, for example."

Moreover, cannabinoids also bind CB2, the cannabinoid receptor that helps regulate the immune system.

Finally, all of the effects of these drugs may not become apparent for a long time. That's because they are stored in the body for a long period of time.

"The fact is these drugs have not been tested in humans, and we don't know what they could do," Huestis says. "There may be acute toxicity; there may be long-term toxicity. We don't know any of that."

And here's another alarming thing that isn't known. Tests show that even the same brand of one of these products may have different drugs -- in different amounts -- at different times. Since the synthetic cannabinoids are very powerful, even a small increase in dose can have much more powerful side effects.

And since these products are not regulated drugs, there's no way to know how big a dose you're getting. No drug is safe if you don't know what it is and how much of it you're taking.

What happens when a person smokes K2, Spice Gold, or other herbal incense products?

Before trying to find out what was in the herbal incense products, Auwarter wanted to know whether the products really had any activity.

So he took what is these days a very unusual step: He and a colleague tested the products on themselves.

They took a packet of a product called Spice Diamond and rolled 300 milligrams - - a tenth of the package -- into a cigarette paper. The two men shared the cigarette, so each consumed only a small dose of about 150 milligrams.

"Nothing happened in the first five minutes. I was just about to roll the next one and suddenly the effects came quite quickly," Auwarter tells WebMD. "I had

massive reddening of the eyes, and a very dry mouth. My heart rate doubled, from 60 to 120 beats per minute. And the feeling of intoxication was like the experience reported by cannabis users."

Auwarter's heart pounded away for the six hours it took for the drug's acute effects to wear off. He did not sleep well that night and felt a slight hangover the next day.

Huffman tells a much scarier story. He says he'd never take the drugs himself, but he recently received an email from a worried parent whose daughter was given something to smoke at a party.

"She thought it was pot, but it was K2," Huffman says. "She was still having effects a week later. And a toxicologist at St. Louis University came by a week ago and said there are all kinds of reports of people having heart rates like 150 and blood pressure shooting up to 200 over 100. That is dangerous."

Are K2, Spice Gold, and other herbal incense products addictive?

Apparently so. Last year, German researchers reported the case of a 20-year-old man who had been using the Spice Gold product daily for eight months.

Not long after starting the product, the man found that he needed larger and larger doses to feel an effect. He quickly increased his use to 3 grams per day -- 10 times the dose that produced the effects described by Auwarter.

The man felt a continuous need for the product. He was unable to get it for a period of time and experienced unrest, drug craving, nightmares, sweating, nausea, tremor, headache, high blood pressure, and racing heartbeat. This went away when he again began using the product.

Finally, the man was persuaded to stop using the product. But fearing a repeat of his earlier experience, he checked into a hospital. Sure enough, he again went through classic withdrawal symptoms that lasted a week.

This clinical description fits with reports that Auwarter has received. He says that while classic drug dependence is rare among cannabis users, it may be much more common among users of synthetic cannabinoids.

Do drug tests detect K2, Spice Gold, and other herbal incense products?

Not yet. Huffman says he heard from the director of a very strict boys' school that gives weekly drug tests to pupils. Despite finding that some of the boys were smoking K2, none of them tested positive on the drug screens.

Auwarter says his team is close to developing a urine test for some of the synthetic cannabinoids. But today, the only way to identify the compounds is via

a blood test -- and that has to be performed before the effects of the drug wear off.

Are K2, Spice Gold, and other herbal incense products legal?

Because the synthetic cannabinoids found in these products are new, they remain legal in many states. Many European nations already have banned some or all of the products.

Kansas was the first state to pass a law banning sale of the products; similar laws have been proposed in Missouri, Tennessee, and several other states.

However, dozens of web sites continue to offer the products for sale.